U.S. Nuclear Regulatory Commission Public Meeting Summary

July 21, 2022

Title: Public Meeting to Discuss the Proposed Rulemaking on Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors

Meeting Identifier: 20220575

Date of Meeting: June 22, 2022

Location: Hybrid, HQ-OWFN-06B02

Type of Meeting: Comment-Gathering

Purpose of the Meeting: The purpose of this meeting was to engage with the public regarding potential regulatory issues to consider during the development of the rulemaking detailed in SECY-21-0109, "Rulemaking Plan on Use of Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors," and Staff Requirements Memorandum SECY-21-0109. Specifically, the aim was to obtain public insights regarding the scope of regulations and guidance documents requiring evaluation for the use of light-water reactor fuel containing uranium enriched to greater than 5.0 weight percent uranium-235 (U-235).

General Details: The U.S. Nuclear Regulatory Commission (NRC) staff conducted a Hybrid public meeting on June 22, 2022, to discuss potential regulatory issues to consider during the development of the rulemaking detailed in SECY-21-0109. The meeting started at 1:00 p.m. ET and concluded at 1:58 p.m. ET. There were approximately 100 participants, including NRC staff and management, representatives from the Department of Energy (DOE), Nuclear Energy Institute (NEI), nuclear power industry, Union of Concerned Scientists (UCS), and other members of the public.

The facilitator, Daniel Mussatti, from the Office of Nuclear Material Safety and Safeguards (NMSS), started the meeting and introduced Bo Pham, the Division Director for the Division of Operating Reactor Licensing (DORL) in the Office of Nuclear Reactor Regulation (NRR) to provide opening remarks.

Bo Pham provided opening remarks for the meeting, welcomed attendees, and described the NRC's goal of risk-informing its regulations and minimizing regulatory burden, while also providing transparency in its rulemaking process. He emphasized the importance of external stakeholder engagement through public meetings and comment periods.

After the opening remarks, Daniel Mussatti welcomed all the attendees and described the meeting logistics. Stacy Joseph, the Rulemaking Project Manager from NMSS, then provided an overview of the agenda and stated that the purpose for the meeting was to engage with members of the public on the regulatory issues associated with the rulemaking on the use of uranium fuel enriched to greater than 5.0 weight percent U-235.

Ms. Joseph described the status of the rulemaking activity and the purpose of the regulatory basis document. Ms. Joseph then provided a brief overview of the rulemaking process, including the multiple opportunities for public participation.

Jackie Harvey, the DORL Lead presented background information regarding industry interest on the use of fuel enriched above 5.0 weight percent U-235. This background discussed the current regulatory framework and the options that the NRC staff is considering throughout this process. Ms. Harvey outlined the NRC's next steps of issuing a regulatory basis for public comment.

After the NRC presentation, stakeholders were given the opportunity to present on the discussion topic. NEI gave a short presentation titled "NEI Presentation for Public Meeting Industry Perspectives on Rulemaking for Greater than 5% Enrichment".

In addition to the formal presentations, the NRC staff welcomed discussion on the following topics:

- Title 10 of the Code of Federal Regulations (10 CFR) and associated guidance documents that should be evaluated in this rulemaking;
- Regulations that will likely require a licensee to request an exemption if they chose to pursue fuel enriched above 5.0 weight percent U-235;
- Rulemaking schedule and impact on stakeholders.

Five attendees gave feedback or asked questions on the NRC presented material: Aladar Csontos of NEI, Fred Smith of the Electric Power Research Institute, Lon Paulson and Scott Murray of Global Nuclear Fuel, and Edwin Lyman of the UCS.

Public Participation Themes:

<u>Regulations To Consider</u>

Mr. Csontos, Mr. Smith and Mr. Paulson each provided their respective thoughts related to Title 10 of the Code of Federal Regulations that should be considered during this proposed rulemaking.

- Mr. Csontos stated that 10 CFR 50.68, "Criticality accident requirements," 10 CFR 71.55, "General requirements for fissile material packages," paragraph (g) and 10 CFR 70.24, "Criticality accident requirements," should be considered.

- Mr. Smith stated that this is an opportunity to combine 10 CFR 50.68, "Criticality accident requirements," and 10 CFR 70.24, "Criticality accident requirements," during this rulemaking.

- Mr. Paulson inquired if there were any considerations associated with Department of Transportation (DOT) regulation changes that would be needed to transport Accident Tolerant Fuel with higher enrichments. The staff stated that the NRC is communicating with DOT and will interface if there is a conflict in the regulations. The regulation addressing this is 10 CFR 71.55, "General requirements for fissile material packages," paragraph (g) which is an exemption to 10 CFR 71.55, "General requirements for fissile material packages," paragraph (d).

Rulemaking Schedule and Stakeholder Impact

Mr. Csontos emphasized that in order to meet the current rulemaking schedule, this effort should include guidance on the data and methods required for adoption of increased enrichment above 5.0 weight percent early in the rulemaking process. Additionally, Mr. Csontos suggested that this rulemaking should focus only on the increased enrichment and avoid items such as fuel fragmentation, relocation and dispersal and higher burnup, which can be addressed via individual license submissions.

Dr. Lyman inquired as to how the burden for a rulemaking would differ from individual exemptions if the NRC does not have the data required to make any kind of generic rules regarding alternatives to the criticality monitoring requirement. The staff responded that a cost-benefit analysis will be performed with this regulatory basis to determine the best path. In addition, the staff stated that it is too early to speak to the breadth of the database that currently exists as this is being explored during this phase of the regulatory basis. With that said, a licensee seeking to utilize any sort of fuel with enrichment above 5.0 weight percent would have to use an NRC approved methodology that has been validated using data that would support that increased enrichment range.

Terminology Clarification

Mr. Murray stated that the industry uses the terms of low enriched uranium plus (LEU+) for enrichment assays of 5.0 to 10.0 weight percent and high-assay low enriched uranium (HALEU) for enrichment assays of 10.0 to 20.0 weight percent. Under this proposed rulemaking the NRC discusses HALEU and wanted to confirm that enrichment assays of 5.0 to 10.0 weight percent will be included as well. NRC staff recognizes that there is different terminology between industry and the NRC. With that said, the NRC utilizes the term HALEU for enrichment assays above 5.0 weight percent up to 20.0 weight percent.

Next Steps:

The NRC plans to issue a draft regulatory basis document for comment by September 2023, considering public and industry feedback obtained during this meeting. The staff will re-examine the proposed schedule to determine if this key milestone can be achieved sooner by leveraging ongoing regulatory innovation efforts.

Attachments:

- 06/22/2022 Public Meeting to Discuss the Proposed Rulemaking on Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors (ADAMS Accession No. ML22153A169)
- 06/22/2022 – NRC Presentation for Public Meeting Regarding the Rulemaking on Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors (ADAMS Accession No. ML22153A451)
- 06/22/2022 – NEI Presentation for Public Meeting Industry Perspectives on Rulemaking for Greater than 5% Enrichment, June 22, 2022 (ADAMS Accession No. ML22172A135)
- 06/22/2022 Transcript of Public Meeting to Discuss the Proposed Rulemaking on Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors July 21, 2022 (ADAMS Accession No. ML22201A017)

MEETING ATTENDANCE

PUBLIC MEETING TO DISCUSS THE PROPOSED RULEMAKING ON INCREASED ERNICHMENT OF CONVENTIONAL AND ACCIDENT TOLERANT FUEL DESIGNS FOR LIGHT-WATER REACTORS

HYBRID, HQ-OWFN-06B02

June 22, 2022, 1:00 P.M. – 3:00 P.M. (Eastern Time)

U.S. Nuclear Regulatory Commission	
Ben Adams	Damaris Marcano
Philip Benavides	Nicolas Mertz
Ilka Berrios	Joseph Messina
Mark Blumberg	Ed Miller
Richard Chang	Daniel Mussatti
James Corson	Donald Palmrose
Amy Cubbage	Charley Peabody
Stephanie Devlin-Gill	Bo Pham
Elijah Dickson	Jason Piotter
Marlayna Doell	William Rautzen
Joe Donoghue	Christopher Regan
David Garmon	William Richards
Adam Gendelman	Carla Roque-Cruz
Edward Harvey	Robert Roche
Jackie Harvey	Dan Ruby
Kevin Heller	Kevin Roach
Shana Helton	Fred Schofer
Kevin Hsueh	Zachary Stone
Tara Inverso	Boyce Travis
Don Johnson	Chris Van Wert
Stacy Joseph	Thomas Vukovinsky
Daniel King	Michael Wentzel
Kiran Kling	Brandon Wise
Angella Love Blair	

Public	
Name	**Affiliation (if provided)**
David E. Bortz	Duke Energy
Frank Goldner	Department of Energy
David J. Mienke	Xcel Energy
Phil Sharpe	Studsvik
Christopher Canniff	EXCEL Services Corporation
Stephen Hess	Jensen Hughes
Jennifer Wheeler	X-energy
Ryan Webster	
Debbie Rowan	Duke Energy
James Fornof	Lightbridge
Fred Smith	

Marty Karr	Centrus Energy
Michelle Guzzardo	Framatome
Janet Schlueter	NEI
Matthew Adler	Duke Energy
Matthew Warren	IBEW
Mark A Brossart	Xcel Energy
Jana Bergman	Curtiss-Wright
Don R Algama	Department of Energy
Brian L Mount	Dominion Energy
Steven Dolley	S&P Global
Jon Johnson	Lightbridge
Aaron Totemeier	Lightbridge
Farhad Mohammadi-Koumleh	CTP
Madeline Feltus	Department of Energy
Lon E. Paulson	Global Nuclear Fuel
Arthur Hyde	Segra Capital Management
Trace Orf	
Leigh Ford	Snake River Alliance
Elisa Calvo Tone	Framatome
Adam Rodman	Segra Capital Management
Rachel Christian	Westinghouse
James D. Smith	Westinghouse
Nima Ashkeboussi	NEI
Peter Diehl (Gast)	
Zachary S. Harper	Westinghouse
Svetlana Lawrence	Idaho National Laboratory
Patrick White	Nuclear Innovation Alliance
Edwin Lyman	Union of Concerned Scientists
Will Maxson	Framatome
Scott P. Murray	Global Nuclear Fuel
Jan Boudart	NEIS
Johnathan Chavers	Southern Nuclear
Susan Hoxie-Key	
Dwayne Blaylock	Enercon
Pearline Teeters	Paschal Solutions
Ernest F. Bates	Southern Nuclear
Joel Rhodes III	Studsvik
Steve W Schilthelm	BWXT
Timothy Tate	Framatome
Calvin Manning	Framatome
Aladar Csontos	NEI
Ray Troy	Court Reporter

Note: Attendance list based on Microsoft Teams participant list and in person attendee sign in sheet. This list does not include individuals who did not provide their last name either in registering for the meeting or by a follow-up email.